

CLAIMS:

1. An inhaler for providing a dose of a dry powder pharmaceutical to a patient, comprising:

a dispersion chamber having an open central interior;

5 at least one bead in the dispersion chamber, with the bead having a characteristic dimension of at least 50 to 90% of an interior height of the dispersion chamber;

an inlet connecting into the dispersion chamber; and

10 an outlet connecting into the dispersion chamber and spaced apart from the inlet.

2. The inhaler of claim 1 wherein the dispersion chamber includes an inner wall forming a bead race, and wherein the bead moves around the bead race upon inhalation by the patient.

3. The inhaler of claim 2 wherein the bead race has a radius of curvature greater than a radius of curvature of the bead.

4. The inhaler of claim 2 wherein the dispersion chamber has a flat bottom surface and a flat top surface adjoining the bead race.

5. The inhaler of claim 1 further comprising means for retaining the bead in the chamber.

20 6. The inhaler of claim 1 wherein the bead moves around chaotically in the dispersion chamber when a patient inhales on the outlet.

7. The inhaler of claim 1 further comprising a dose platform adjacent to the inlet, for holding a dose of a dry powder pharmaceutical.

8. The inhaler of claim 1 further comprising an obstruction in the dispersion chamber to cause the bead to move chaotically.

5 9. The inhaler of claim 1 wherein the bead has or acquires a static electrical charge, and particles of the dry powder also have or acquire a static electrical charge of the same polarity, so that the bead and the particles of dry powder repel each other.

10 10. The inhaler of claim 1 wherein the dispersion chamber comprises a separate component, installable into, and removable from the inhaler.

11. The inhaler of claim 1 wherein a plurality of beads are located in the dispersion chamber, and wherein at least one of the beads includes a discontinuity.

12. The inhaler of claim 11 wherein the bead having the discontinuity is polygonal shaped, and the discontinuity comprises a corner.

15 13. The inhaler of claim 11 wherein the bead having the discontinuity comprises a sphere with a flat surface.

14. The inhaler of claim 1 further comprising means for providing feedback to the patient based on an airflow rate in the dispersion chamber.

20 15. The inhaler of claim 1 wherein from 2 to 10 round beads are provided in the dispersion chamber.

16. The inhaler of claim 15 wherein the beads move around the dispersion chamber at 4000-10,000 rpm.

17. The inhaler of claim 1 wherein the dispersion chamber has a characteristic dimension that is from 4 to 20 times greater than the characteristic
5 dimension of the bead.

18. An inhaler for providing a dose of a dry powder pharmaceutical to a patient, comprising:

a dispersion chamber having an open central interior region;

at least one bead in the dispersion chamber, with the dispersion chamber
10 having an interior characteristic dimension that is 4 to 20 times greater than a characteristic dimension of the largest bead in the dispersion chamber;

an inlet and an outlet connecting into the dispersion chamber; and

a single unit dose blister container supported on the inlet, and containing a single dose of a dry powder pharmaceutical.